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10/727,478

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Noh Yeal Kwak

29936/39861

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12/14/2004

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EXAMINER

SMITH, BRADLEY

ART UNIT

PAPER NUMBER

2824

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/727,478

Applicant(s)

KWAK, NOH YEAL

Examiner

Bradley K Smith

Art Unit

2824

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-6 is/are rejected.
- 7) ☒ Claim(s) 2 and 3 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: search notes.

**DETAILED ACTION**

***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Lin et al. (US Patent 6,297,098). Lin et al. disclose forming a first well region by performing an ion implantation process for implanting first ions into a semiconductor substrate, and then forming a second well region in the first well region by performing an ion implantation process for implanting second ions having larger mass than the first ions; and forming a well region by performing an annealing process on the result structure (see column 2 lines 20-30). With regards to claim 5, Lin et al. disclose a making a flash memory cell, so inherently it would have a tunnel oxide a floating gate, a dielectric layer and a control gate electrode.

***Claim Rejections - 35 USC § 103***

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US Patent 6,297,098) in view of Chau et al. (US Patent 6,198,142). Lin et al. disclose forming a first well region by performing an ion implantation process for implanting first ions into a semiconductor substrate, and then forming a second well region in the first well region by performing an ion implantation process for implanting second ions having larger mass than the first ions; and forming a well region by performing an annealing process on the result structure (see column 2 lines 20-30). However Lin fail to disclose an RTP process using hydrogen or nitrogen gas atmosphere for 10 –60 seconds at 900-1000 degrees C. Whereas Chau et al. disclose an RTP process using hydrogen or nitrogen gas atmosphere for 10 –60 seconds at 900-1000 degrees C (column 8 lines 40-50). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lin and Chau because the RTP treatment would active the impurities.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US Patent 6,297,098) in view of Brigham et al. (US Patent 6,720,631). Lin et al. disclose forming a first well region by performing an ion implantation process for implanting first ions into a semiconductor substrate, and then forming a second well region in the first well region by performing an ion implantation process for implanting

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second ions having larger mass than the first ions; and forming a well region by performing an annealing process on the result structure (see column 2 lines 20-30).

However Lin et al fails to disclose a screen oxide. Whereas Brigham et al. disclose a screen oxide to suppress damage from ion implantation (column 2 line 30-46).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lin and Brigham, because the oxide would suppress damage (column 2 line 30-46).

### ***Allowable Subject Matter***

7. Claims 2 and 3 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record neither teaches nor suggests implanting phosphorus (P) ions at a tilt angle of 3 degrees to 13 degrees with a dose in the range of  $1E11$  ions/cm<sup>2</sup> to  $1E14$  ions/cm<sup>2</sup> at an energy of about 500 Kev to 3000KeV, by using a high-energy ion implantation device (claim 2), implanting arsenic ions at a tilt angle of 3 degrees to 13 degrees with a dose in the range of  $1E11$  ions/cm<sup>2</sup> to  $1E14$  ions/cm<sup>2</sup> at an energy of about 100 Kev to 300 KeV, by using a middle current implantation device (claim 3).

### ***Conclusion***

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley K Smith whose telephone number is (571) 272-1884. The examiner can normally be reached on 10-6 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Brad Smith', with a large, stylized circular flourish at the end.

Brad Smith  
Primary Examiner  
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